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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,847	09/12/2003	Charles Edward Boardman	24-AT-135243	8534

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EXAMINER	
GREENE JR, DANIEL LAWSON	
ART UNIT	**PAPER NUMBER**
3641	

DATE MAILED: 09/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/661,847	BOARDMAN ET AL.
	Examiner	Art Unit
	Daniel L Greene Jr.	3641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/12/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore;

A. the protrusion extending along a length of the support beams receivable within the groove of the support plate as disclosed in claim 5,

B. the statement that at least one removable support plate is capable of being disposed on one of the support beams as recited in claims 1 and 13, and

C. the statement that a flow outlet extends on an opposite side of a removable support block in claim 17,

Must be shown or the features canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement

Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:

A. the phrase "control rod guide tubes 56" in paragraph 0020 line 5 is not shown in the drawings,

B. the "reactor vessel 12" in paragraph 0023 line 4, was previously disclosed as "bottom head 12" in paragraph 0018, lines 5 and 6,

C. in the last line of paragraph 0026, it is not shown that figure 5 includes "a plurality of core support beams 150",

D. figure 7 does not show "flow outlet 180" according to line 3 of paragraph 0029 and,

E. the "cruciform shaped guide tube 112" in paragraph 0030, was previously disclosed as "guide tube opening 112".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following are quotations of the first and second paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 5-8,13-17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention for the reasons set forth below.

With regard to claims 1, 13, 14, the specification fails to disclose how and in what manner at least one removable support plate may be disposed on only one support beam.

With regard to claim 5, applicant's own admission in paragraph 0026 lines 3-6 state that the specification fails to disclose how and in what manner the support beams comprise a protrusion extending along a length thereof or how and in what manner one protrusion may be received by more than one groove.

With regard to claims 5 and 14, the specification fails to disclose how and in what manner a single groove may receive a plurality of support beams.

With regard to claim 6 and 15, the specification fails to disclose how and in what manner one support plate comprises only one support plate flow passage.

With regard to claim 7 and 16, the specification fails to disclose how and in what manner one support plate comprises only one support block and how only one support

block flow passage may have flow communication with more than one support plate flow passage.

With regard to claim 8 the specification fails to disclose how and in what manner The flow inlet portion may be received within more than one support plate flow passage.

With regard to claim 17 the specification fails to disclose a flow outlet extending on an opposite side to the inlet flow projection.

4. Claims 5 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitation "support beams" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 9 recites the limitation "quick tube opening" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-6 and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,127,445 to Anthony.

Anthony clearly discloses an apparatus for supporting fuel assemblies (16) in a reactor pressure vessel (12) including a core (14) comprising a plurality of support beams (19 and 21) and at least one removable support plate (54) disposed on at least one of said plurality of support beams (19 and 21) wherein said at least one removable support plate (54) and said plurality of support beams (19 and 21) form a core support

(18) comprising a support ring (29) having an inner periphery and an outer periphery, said plurality of support beams (19 and 21) extending between said inner periphery, and said plurality of support beams (19 and 21) intersecting one another to form a support beam matrix wherein said at least one removable support plate (54) is configured to be removed from above the core and said at least one removable support plate (54) comprising at least one groove (62) for receiving at least one of said plurality of support beams (19 and 21), wherein said plurality of support beams (19 and 21) comprise a protrusion (the combination of 22 and 23) extending along a length thereof, said protrusion (the combination of 22 and 23) receivable within said at least one groove (62) wherein said at least one removable support plate (54) comprising at least one support plate flow passage (in Figures 1-6, and column 2 lines 67+, column 3 lines 1-7, and 50+, and column 4 lines 26-45.

6. Claims 9, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent 62-5197.

62-5197 discloses a support plate comprising a top surface, a bottom surface spaced apart from said top surface by a thickness, said bottom surface having at least one groove; a guide tube opening (12) through said thickness; and at least one flow passage (11 and 13) through said thickness, in figures 4,7,and 8.

In regard to claim 12, 62-5197 further discloses a removable support block having a flow inlet portion (9) extending from one side of said removable support block, said flow inlet portion providing flow communication to another side of said removable

support block, said flow inlet portion receivable within said at least one flow passage (13) in figures 5 and 8.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anthony in view of Japanese Patent 62-5197.

Anthony discloses applicant's invention as described above. Anthony does not expressly disclose a removable support block disposed on the removable support plate, wherein said removable support block has at least one support block flow passage in flow communication with said at least one support plate flow passage.

62-5197 as also described above discloses a removable support block with at least one removable support block flow passage in flow communication with said at least one support plate flow passage in figures 2,4,5,7 and 8.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to replace the single support plate with the support plate and support block configuration of 62-5197 in order to gain the advantages therefrom (i.e. reduced flow restriction) as such results are in no more than the use of conventionally known techniques, designs and layouts available within the art.

Note that MPEP 2144 states that a making separable, rearrangement of parts, duplication of parts and/or changing the shape does not make an invention patentably distinct. See *In re Dulberg,* 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961), *In re Japikse,* 181 F.2d 1019 86 USPQ 70 (CCPA 1950) and *In re Kuhle,* 526 F.2d 553, 188 USPQ 7 (CCPA 1975), *In re Harza,* 274 F.2d 669, 124 USPQ 378 (CCPA 1960), *In re Dailey,* 357 F.2d 669, 149 USPQ 47 (CCPA 1966)

62-5197 further discloses claim 8 in the rejection of corresponding parts above.

9. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anthony as modified by 62-5197 above, and further in view of U.S. Patent 3,888,372 to Berglund et al. hereafter Berglund.

Anthony as modified by 62-5197 above, discloses applicants invention substantially as claimed, however Anthony as modified does not expressly disclose that the bottom surface has a first, second, third and fourth groove positioned around the guide tube opening.

62-5197 discloses a support plate with a bottom surface having a groove positioned around the guide tube opening, however it does not expressly disclose that the bottom surface has a first, second, third and fourth groove positioned around the guide tube opening.

Berglund teaches that the supporting surface of the supporting member of a fuel cell may be round or square in Figures 2 and 3, column 2, lines 11-12, 20-25, and column 3 lines 9-31.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to alter the shape of the support plate of 62-5197 from round to square in order to gain the advantages thereof (i.e. being able to throttle or adjust the flow there through) as such results are in no more than the use of conventionally known methods, techniques, designs and layouts available within the art.

In regard to claim 11, selecting an art level equivalent square shape of the support plate of 62-5197 inherently causes said groove to take on a square shape which causes at least two of said first groove, second groove, third groove and fourth groove to extend along said bottom surface substantially parallel to each other and one end of at least one of said first groove, second groove, third groove and fourth groove to intersect with at least one of said first groove, second groove, third groove and fourth groove, in the rejection of corresponding parts above.

Note that MPEP 2144 states that rearrangement of parts, duplication of parts and/or changing the shape does not make an invention patentably distinct. See *In re Japikse,* 181 F.2d 1019 86 USPQ 70 (CCPA 1950) and *In re Kuhle,* 526 F.2d 553, 188 USPQ 7 (CCPA 1975), *In re Harza,* 274 F.2d 669, 124 USPQ 378 (CCPA 1960), *In re Dailey,* 357 F.2d 669, 149 USPQ 47 (CCPA 1966)

10. **Claims 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,141,397 to Chaki et al. hereafter Chaki in view of Anthony.**

Chaki discloses a nuclear reactor comprising a reactor pressure vessel (8); a reactor core (1) located inside said reactor pressure vessel (8); and a core plate (6) located inside said reactor pressure vessel (8) and at least one removable support plate

(10) disposed on said core plate (6) in Figure 1 and column 1 lines 8-17. Chaki does not expressly disclose that the core plate comprises a plurality of support beams.

Anthony teaches a core plate comprising a plurality of support beams and at least one removable support plate disposed on at least one of said plurality of support beams as previously explained above.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to employ the core support structure of Anthony in the nuclear reactor of Chaki in order to gain the advantages thereof (i.e. stronger, lower coolant flow impedance, improved thermal margin, etc.) as such results are in no more than the use of conventionally known methods, techniques, designs and layouts available within the art.

Chaki further discloses claim 15 in Figure 2.

Chaki further discloses claim 16 wherein the removable support plate (10) comprises at least one removable support block (16) comprising at least one support block flow passage in flow communication with said support plate flow passage in Figures 1,2,4, and 7.

Chaki further discloses claim 17 wherein the removable support block (16) comprises an inlet flow projection extending from one side and receivable within said support plate flow passage in Figure 7.

Chaki also discloses claim 18 in Figures 6 and 7.

11. **Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chaki as modified by Anthony above and further in view of U.S. Patent 5,943,385 to Drecker et al. hereafter Drecker.**

Chaki as modified above discloses applicants inventions substantially as claimed and described above, however Chaki as modified does not expressly disclose that said internal flow passage directs flow into a first channel and a second channel, said first channel and a second channel located within said at least one removable support block (also know in the art as a transition piece or tie plate.)

Drecker discloses a removable support block (the combination of (34) (32) and (35)) wherein said internal flow passage directs flow into a first channel and a second channel and said first channel and a second channel are located within said at least one removable support block, wherein said first channel has a first flow outlet and said second channel has a second flow outlet, in prior art Figure 2, column 4 lines 45+, and column 4 lines

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to utilize the transition piece of the prior art disclosed in Drecker in order to gain the advantages thereof (i.e. reduce the pressure drop of the coolant flow) as such results are in no more than the use of conventionally known methods, techniques, designs and layouts available within the art.

As previously stated, MPEP 2144 states that a making separable, rearrangement of parts, duplication of parts and/or changing the shape does not make an invention patentably distinct. See *In re Dulberg,* 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA

1961), *In re Japikse,* 181 F.2d 1019 86 USPQ 70 (CCPA 1950) and *In re Kuhle,* 526 F.2d 553, 188 USPQ 7 (CCPA 1975), *In re Harza,* 274 F.2d 669, 124 USPQ 378 (CCPA 1960), *In re Dailey,* 357 F.2d 669, 149 USPQ 47 (CCPA 1966)

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and the general state of the nuclear art in nuclear reactor support structures and configurations.

13. Examiner's Note: Examiner has cited particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant, in preparing the responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel L Greene Jr. whose telephone number is (703) 605-1210. The examiner can normally be reached on Mon-Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael J Carone can be reached on (703) 306-4198. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DIG 9/10/2004

MICHAEL J. CARONE
SUPERVISORY PATENT EXAMINER